

OMB Approval No. 2700-0087

CHANDRA X-RAY OBSERVATORY (CXO)
RESEARCH PROGRAM

Cycle 4

NASA Research Announcement Soliciting
Proposals for Basic Research

NRA 02-OSS-02

Release Date: January 22, 2002
Proposal Due Date: March 15, 2002

Office of Space Science
National Aeronautics and Space Administration
Washington, DC 20546-0001

CHANDRA X-RAY OBSERVATORY

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SUMMARY OF SOLICITATION

This NASA Research Announcement (NRA) solicits basic research proposals for participation in the National Aeronautics and Space Administration (NASA) program for the conduct of space science observations and subsequent analysis of the resultant scientific data from the *Chandra X-ray Observatory* (CXO). The NRA also solicits proposals for research making use of publicly available archived Chandra data and for theoretical and modeling studies related to the *Chandra* mission. The primary goal of the *Chandra* mission is the investigation of the nature and physics of astronomical objects as revealed through their X-ray emission.

This solicitation offers the opportunity for the submission of six different types of proposals (see details in Section C.2 of Appendix C of this NRA):

- (1) **General Observing Projects**, involving new *Chandra* observations that can be taken without regard to length of total observing time (regardless of the number of objects observed);
- (2) **Large Observing Projects**, involving new *Chandra* observations that require more than 300 ksec to be taken (regardless of the number of objects observed);
- (3) **Target of Opportunity Projects** that are triggered by the occurrence of an unpredictable astronomical phenomenon (e.g., a supernova);
- (4) **Joint Observing Projects** that require multiwavelength sets of data taken by both *Chandra* and either (i) the Hubble Space Telescope (HST); (ii) one of the ground-based telescopes (except Gemini) operated by the National Optical Astronomy Observatories (NOAO); or (iii) the XMM-Newton mission operated by the European Space Agency (ESA);
- (5) **Theory/Modeling Projects** (new with this *Chandra* Cycle 4 NRA) that seek to better understand and interpret the data that have been taken with *Chandra*, or that suggest new observations that might be taken to test a new hypothesis; and
- (6) **Archival Research Projects** that use data from the *Chandra* archives.

The observations selected as a result of this NRA will be implemented during a one-year period beginning about October 15, 2002. Based on guidelines set by the *Chandra* Observing Policy, 85% of the on-target observing time during this cycle remaining after allocation of 3% calibration and 5% Director's Discretionary Time is available for General Observations (GO), with the remaining 15% allocated to Guaranteed Time Observations (GTO). The time available for General Observers under this solicitation is estimated at about 16 Msec. It is anticipated that further opportunities for participation in the *Chandra* Research Program will be announced annually.

Participation is open to all categories of organizations, both domestic and foreign, including educational institutions, profit and nonprofit organizations, NASA Centers, and other Government agencies. Generally awards will be implemented by means of grants. Although proposals from commercial firms are welcome, NASA does not intend to award contracts as a result of this NRA, and no profit or fee will be paid to commercial organizations receiving grant

awards. Awards to a NASA Center (including JPL) and other U.S. Government institutions will be handled through transfer of funds from NASA. Proposals may be submitted at any time during the period ending per the schedule below; proposals received after the due date will be held for the next review cycle. Letters of Intent to Propose are not requested. Proposals will be evaluated by a scientific peer review. Selections will be announced per the schedule below.

Funds for awards under this NRA are expected to be available subject to the annual NASA budget cycle. The Government's obligation to make awards is contingent upon the availability of appropriated funds from which payment for award purposes can be made and of proposals that the Government determines are acceptable for award under this NRA. The total amount of funding available for the support of investigations in response to this NRA is anticipated to be \$11 M. It is anticipated that somewhat in excess of 200 grants will be awarded, although this depends on the outcome of the review. Previously grant sizes have average about \$50K.

Proposers for new observations whose investigations are selected will have exclusive use of their data for 12 months after receipt of the data. After this 12-month period, the data will be placed in a public data archive. There are no proprietary restrictions on data once placed in the archive. Thus, scientists who wish to use the archives, but who do not require funding, need not respond to this NRA. In any case, scientists who choose to analyze archival *Chandra* data, whether funded through this solicitation or not, should understand that these data are open to the public at all times and may not be reserved for their proprietary use.

The proposal review will be conducted in two stages. During the first stage, the scientific and technical merits of the proposed investigation will be evaluated. For proposals that request observations, the appropriateness of using *Chandra* to achieve the scientific objectives, as compared to other available observatories, will also be considered. For proposals using only archival data, the value of providing funding for the proposed investigation relative to an unfunded study will be a consideration. In the second stage of the selection process, investigators whose proposals have been identified for continued consideration based on the excellence of the proposed science will be asked to submit a proposed budget to support their investigation and will also be given the opportunity to submit an optional Education and Public Outreach (E/PO) proposal (see Appendix E). Proposers not recommended to proceed to Stage 2 are not prohibited from preparing a Stage 2 proposal, but should be aware that their proposed investigation is unlikely to be selected. A subset of the original review panel will be convened to evaluate the proposed budgets. Proposed E/PO programs will be reviewed independently. Based upon overall considerations of both scientific and cost factors, the *Chandra* Program Scientist will recommend a set of proposals for consideration by the Selecting Official for final selection and award.

Appendix A provides an overview of the *Chandra* mission. Appendix B gives the general instructions for responding to NASA Research Announcements. Appendix C, which supersedes and augments Appendix B, provides additional information on proposal submission and subsequent evaluation, selection, and implementation that is specific to this NRA. Appendix D describes the forms and instructions needed to prepare proposals in response to this NRA. Appendix E describes the E/PO program, proposals for which are encouraged to be submitted in conjunction with Stage 2 budget proposals.

Technical and reference documents are available from the CXC over the World Wide Web or in hard copy by request at the address below. *The Chandra Proposer's Observatory Guide* (also available via the WWW) contains an overview of the observatory's capabilities, as well as details on information useful for proposing for *Chandra* observing time (e.g., instructions for assessing feasibility, instrument summaries, constraint summaries, etc.).

The following summary information applies to this CXO Research Program NRA:

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| IDENTIFIER: | NRA 02-OSS-02 |
| NUMBER REQUIRED: | The entire Stage 1 proposal and the Cover Page and Budget Form of the Stage 2 proposal must be submitted electronically. One paper copy of the Stage 2 proposal with institutional signatures is required from both U.S. and foreign institutions. |
| SUBMIT PROPOSALS ELECTRONICALLY: | By the World Wide Web to http://cxc.harvard.edu/soft/RPS/Chandra.html OR by E-mail to rps@head-cfa.harvard.edu |
| SCHEDULE: | Stage 1 science proposals due: 7:00 pm EST, March 15, 2002 (00:00 UT, 16 March). Stage 1 selections announced: early July 2002. Stage 2 cost proposals requested: early July 2002. Stage 2 proposals, endorsements, and optional E/PO proposals due: mid-August 2002. Final Selection of proposals: early October 2002. Initiate Cycle 4 observations: October 15, 2002. |
| OBTAIN ADDITIONAL PROGRAMMATIC INFORMATION OR TECHNICAL INFORMATION ON THE PROPOSAL PROCESS FROM: | Dr. Donald Kniffen Chandra Program Scientist Code SZ Office of Space Science National Aeronautics and Space Administration Washington, DC 20546-0001 USA Tel: 202-358-0351 FAX: 202-358-3096 E-mail: dkniffen@hq.nasa.gov |

SELECTING OFFICIAL:

Dr. Anne Kinney
Director, Astronomy and Physics Division
Office of Space Science

DIRECT TECHNICAL
QUESTIONS CONCERNING THE
CXO TO:

Chandra Director's Office
<http://cxc.harvard.edu>, click on "helpdesk"
or E-mail at cxchelp@cfa.harvard.edu
OR by mail/phone/FAX:
Chandra X-ray Center
Mail Stop 4
Smithsonian Astrophysical Observatory
60 Garden Street
Cambridge, MA 02138-1516
USA
Tel: 617-495-7282
FAX: 617-495-7356

RETRIEVE NRA
ELECTRONICALLY FROM:

<http://spacescience.nasa.gov>
select "Research Opportunities"

Statement Concerning Safety. Safety is the freedom from those conditions that can cause death, injury, occupational illness, damage to or loss of equipment or property, or damage to the environment. NASA's safety priority is to protect: (1) the public, (2) astronauts and pilots, (3) the NASA workforce (including employees working under NASA instruments), and (4) high-value equipment and property.

NASA appreciates your interest and cooperation in participating in Cycle 4 of the *Chandra* General Observer Program.

Anne L. Kinney, Director
Astronomy and Physics Division
Office of Space Science

APPENDICES

- A: *Chandra* Mission Description
- B: Guidelines for Responding to NASA Research Announcements for Solicited Basic Research Proposals
- C: Additional Information Regarding Proposal Submission, Evaluation, Selection, and Implementation
- D: Instructions for Filling in *Chandra* Stage 1 Proposal Forms
- E: Education/Public Outreach Program